

What is claimed is:

1. A method for providing channel access schedules, comprising:

collecting traffic flow information from at least one node operating on a network;

calculating the channel access schedules for the at least one node based on the information, the channel access schedules configured to provide no more than a predetermined level of transmit collisions between nodes;

disseminating the channel access schedules to the at least one node; and

switching the network to the channel access schedules.
2. The method of claim 1, wherein calculating comprises iteratively harmonizing the channel access schedules of nodes on the network.
3. The method of claim 2, wherein harmonizing comprises minimizing a multivariate function of connectivity between the nodes.
4. The method of claim 3, wherein harmonizing comprises applying at least one of a list of techniques for solving mathematically hard problems consisting of genetic algorithms, complete searches, heuristics and simulated annealing.
5. The method of claim 1, wherein calculating comprises:

creating schedules; and

iteratively harmonizing the created schedules until the predetermined level of transmit collisions is obtained.

6. The method of claim 5, wherein harmonizing comprises minimizing a multivariate function of connectivity between the nodes.
7. The method of claim 6, wherein harmonizing comprises applying at least one of a list of techniques for solving mathematically hard problems consisting of genetic algorithms, complete searches, heuristics and simulated annealing.
8. The method of claim 5, wherein creating comprises:
- determining a number of transmit slots to be assigned for a node based on the traffic flow information for the node; and
 - randomly assigning the number of transmit slots as part of a group of time slots for the node.
9. The method of claim 8, wherein harmonizing comprises:
- determining if transmit collisions exist between transmit slots assigned to nodes; and
 - reassigning transmit slots for nodes where transmit collisions exist.
10. The method of claim 9, wherein determining if collisions exist comprises:
- defining collision sets for the nodes of the network to include neighbor nodes and nodes having at least one common neighbor node;
 - comparing transmit slots of a node with transmit slots of nodes in its collision set; and
 - defining a collision when a transmit slot in the node corresponds with a transmit slot in the nodes of its collision set.

11. The method of claim 9, wherein reassigning comprises randomly choosing at least one of moving transmit slots with collisions to slots that avoid collisions and randomly reassigning transmit slots with collisions and without collisions.
12. The method of claim 11, wherein a probability of choosing randomly reassigning transmit slots is less than a probability of choosing moving transmit slots.
13. The method of claim 11, wherein moving transmit slots comprises randomly moving transmit slots.
14. The method of claim 8, comprising placing constraints on randomly assigning the number of transmit slots to provide for at least one constraint taken from a list consisting of maintaining a minimum separation between transmit slots and maintaining predetermined energy levels over portions of the group of time slots.
15. The method of claim 1, wherein collecting comprises at least one master node collecting the traffic flow information.
16. The schedule of claim 1, wherein calculating the channel access schedules comprises calculating changes to existing channel access schedules.
17. The method of claim 1, comprising;
- calculating a series of channel access schedules; and
- batching the series of channel access schedules for dissemination as a group.

18. The method of claim 1, wherein disseminating comprises distributing the channel access schedules by at least one technique taken from a list consisting of a flood technique, a point-to-point protocol and a multicast protocol.
19. The method of claim 1, wherein switching comprises synchronizing the nodes of the network by at least one synchronizer taken from a list consisting of an internal clock, a global positioning system and an energy pulse.
20. The method of claim 1, wherein calculating comprises individual nodes operating on the network independently creating their respective channel access schedule.
21. The method of claim 20, wherein creating comprises harmonizing the respective channel access schedule of the individual nodes with channel access schedules of neighbor nodes of the individual nodes and of nodes having at least one common neighbor with the individual nodes.
22. The method of claim 20, wherein calculating comprises synchronizing the independent creation of respective access schedules.
23. A computer program tangibly stored on a computer-readable medium and operable to cause a computer to enable a network to determine channel access schedules for nodes operating on the network, the computer program comprising instructions to:
- collect traffic flow information from the nodes;
 - calculate the channel access schedules for the nodes based on the information, the channel access schedules configured to provide no more than a predetermined level of transmit collisions between nodes;

disseminate the channel access schedules to the nodes; and

switch the network to the channel access schedules.

24. The computer program of claim 23, wherein the program is individually operable by the nodes.

25. The computer program of claim 24, wherein the instructions to calculate comprise instructions to:

create a node channel access schedule for an individual nodes; and

harmonize the node channel access schedule with channel access schedules of collision set member nodes consisting of neighbor nodes of the individual node and of nodes having a common neighbor with the individual node until the predetermined level of transmit collisions is obtained.

26. The computer program of claim 25, wherein the instructions to harmonize comprise instructions to minimize a multivariate function of connectivity between the collision set member nodes.

27. The computer program of claim 26, wherein the instructions to harmonize comprise instructions to apply at least one of a list of techniques for solving mathematically hard problems consisting of genetic algorithms, complete searches, heuristics and simulated annealing.

28. The computer program of claim 25, wherein the instructions to create comprise instructions to:

determine a number of transmit slots to be assigned for the individual node based on the traffic flow information for the individual node; and

randomly assign the number of transmit slots as part of a group of time slots for the individual node.

29. The computer program of claim 28, wherein the instructions to harmonize comprise instructions to reassign transmit slots for the individual node when a transmit slot in the individual node corresponds with a transmit slot of the channel access schedule of at least one of the collision set member nodes.

30. The computer program of claim 29, wherein the instructions to reassign comprise instructions to randomly branch to at least one of instructions to move transmit slots with collisions to slots that avoid collisions and instructions to randomly reassign transmit slots with collisions and without collisions.

31. The computer program of claim 30, wherein the instructions to randomly branch are weighted to choose instructions to randomly reassign with a less probability than to choose instructions to move transmit slots.

32. The computer program of claim 30, wherein the instructions to move transmit slots comprises instructions to randomly move transmit slots.

33. The computer program of claim 28, comprising instructions to constrain the number of transmit slots to maintain at least one of a minimum separation between transmit slots and predetermined energy levels over portions of the group of time slots.

34. A network configured to determine channel access schedules for nodes operating on the network, comprising:

a collection module to obtain traffic flow information from the nodes;

at least one processor to calculate the channel access schedules for the nodes based on the information and to configure the channel access schedules to provide no more than a predetermined level of transmit collisions between nodes;

a broadcast module to disseminate the channel access schedules to the nodes; and

a synchronizer to switch the network to the channel access schedules at a given time.

35. The network of claim 34, wherein the at least one processor iteratively minimizes a multivariate function of connectivity between the nodes.

36. The network of claim 35, wherein the at least one processor applies at least one of a list of techniques for solving mathematically hard problems consisting of genetic algorithms, complete searches, heuristics and simulated annealing.

37. The network of claim 36, wherein individual nodes contain one of the at least one processors to calculate an individual channel access schedule.